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ORIGINAL ARTICLE



Making land-use change and markets: the global-local entanglement of producing rice in Bagré, Burkina Faso

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ABSTRACT

Since the 1970s the government of Burkina Faso together with international donor organizations has pushed for increasing national rice production to cope with the country's food import dependency. This paper traces this development and illustrates that rice production in Burkina Faso is the outcome of interrelated global and local processes. Drawing on nine months of ethnographic fieldwork in Burkina Faso the paper sketches the historical, legal and socioeconomic conditions, challenges and practices behind the increasing rice production. Focusing on the Bagré Growth Pole Project, we describe how particular configurations of local, national and global connections and disconnections around the creation of a Burkinabe rice market are brought into being. A major point of the paper is to illustrate that combining systemic and processual theoretical perspectives is highly illuminating in this respect. Concretely, the paper achieves this by bringing into dialogue the telecoupling literature concerned with the globalization of land-use change and the geographies of marketization literature focusing on market-making practices. This allows understanding the rice market described as an ongoing and grounded process within a global systemic configuration.

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Introduction

Promoting agricultural development to improve food security, reducing poverty and eventually rendering Burkina Faso competitive on selected global food markets is high on the political agenda of the West African country (e.g. PNDES 2016–2020). Current statistics and projections emphasize the continuous importance of the rural sector to secure livelihoods: 80% of the country's population are primarily engaged in the agricultural sector, which accounts for roughly one third of Burkina Faso's gross domestic product (FAO 2014). While cash crops such as cotton, cashews and mangos (OEC 2017) are traded on global markets, the vast majority of farmers produces staple crops such as millet, maize, sorghum, and rice for their own consumption.¹ To aid and eventually transform this occupational dependency, the government of Burkina Faso has launched a number of policy initiatives. For example, the National Economic and Societal Development Plan outlines the country's agricultural potential and focuses on unexploited land and better use of human resources (PNDES 2016–2020). The current food insecurity experienced in the country and the high poverty rates among its rural inhabitants are primary concerns in this initiative (PNDES 2016–2020, 23).

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A key aspect of the National Development Plan is the promotion of so-called agricultural growth poles. These are to function as centres and drivers of agricultural and rural development.

Growth poles are simultaneous, coordinated investments in many sectors, like agriculture in the present case, to support self-sustaining industrialization in a country. They usually combine public and private investments and are specifically built around an already-existing resource at a specific location in an economy. (Picard, Coulibaly, and Smaller 2017)

Developed in the 1950s, agricultural growth poles have recently gained attention and prominence once again amongst development planners and strategists since the global food and financial crisis of 2007/08 (Dannenberg, Revilla Diez, and Schiller 2018, 135). Across Africa, 36 agriculture-based growth poles and nine growth corridors have been developed (Picard, Coulibaly, and Smaller 2017, 1). Building on public-private infrastructure investments in and across regions, their promotion assumes that economic growth can be efficiently fuelled by concentrating on key sectors and their integration into regional and global markets (Picard, Coulibaly, and Smaller 2017; Dannenberg, Revilla Diez, and Schiller 2018). While growth poles have triggered discussions amongst economists and development strategists, they have only recently become the object of empirical research that foregrounds their situated realities on the ground (Dannenberg, Revilla Diez, and Schiller 2018; Stein and Kalina 2019). In this paper we focus on one of these growth poles, the Bagré Growth Pole Project located in the Nakambé valley region of Central Eastern Burkina Faso. Through the construction of a vast area of irrigated rice plains downstream from the Bagré Dam, this growth pole project has reshaped the landscape with the objective of reducing Burkina Faso's widening rice gap, which should alleviate rural poverty and food insecurity.

Tracing and understanding the connection between the land-use changes observed in Bagré and the making of a national rice market is achieved by connecting two strands of literature, namely telecoupling (Liu et al. 2013; Kapsar et al. 2019; Friis and Nielsen 2019a) and geographies of marketization (Berndt and Boeckler 2012). Bringing the telecoupling literature (Liu et al. 2013; Eakin et al. 2014; Friis and Nielsen 2014, 2017a, 2019a; Friis et al. 2016; Kapsar et al. 2019) into dialogue with the geographies of marketization literature (Berndt and Boeckler 2012; Boeckler and Berndt 2013; Ouma 2013, 2015; Ouma, Boeckler, and Lindner 2013) has not yet been done but, as we will show, offers insights into global-local relations.

The telecoupling literature is concerned with the globalization of land-use change. It proposes a systemic approach to the relation of distantly coupled human-environment systems by differentiating between sending, receiving and spill-over systems and producing strong analyses of the spatial distribution of and relations between contemporary land-use changes (Liu et al. 2013, 2014; Friis and Nielsen 2019a). The emphasis in this literature on systems and their connections through various flows of information, people, technologies, capital and policies has resulted in less attention being paid to how these systems emerge and take shape. In addition, causality has mostly been analysed in terms of causal effects, whereas the 'how' of causal mechanisms remains largely unattended (Carlson et al. 2018, 3). The literature on geographies of marketization focuses on market-making practices, and also, implicitly, on the land-use systems created by them. By emphasizing the actual practical work of 'market-making' in a particular place, this approach therefore complements telecoupling research because it allows for 'deal[ing] with the constructions, materialities, socialities, and real effects of radical market orientation in our global modernity' (Berndt and Boeckler 2012, 200). We argue that combining the telecoupling and geographies of marketization literature within the setting of Burkina Faso's rice market will allow for a better understanding of how the specific modes of rice market-making in Bagré constitute the rice sector or system. In particular, combining these two literatures enables us to attend to both, the particular local form of the rice sector and its specific place within the broader global rice ecology. Switching lenses between a systemic and a practice-oriented perspective thus deepens our understanding of the rice market in Burkina Faso as simultaneously global and local.

The remainder of this paper is structured as follows. First, a brief introduction to the telecoupling and geographies of marketization literature is given. The subsequent methods section describes both the fieldwork and methods applied as well as the different data sources that are analysed. We then move to results. Here we present the study area and provide the background knowledge of the Bagré Growth Pole Project. We also focus on the relation between this project and global, national and local rice marketization in Bagré. In the discussion section, we argue that the unfolding of this relationship merits analytical attention and that the combination of telecoupling and geographies of marketization research facilitate this. The paper is completed by a conclusion.

Theoretical background

Telecoupling

Since its first explicit formulation (Liu et al. 2013), the concept of telecoupling has generated insights into the globalization of land-use change (see also Kapsar et al. 2019 for an overview and synthesis). Having emerged from land system science (see Eakin et al. 2014 for an overview of the concept's genealogy; Friis et al. 2016; Liu et al. 2019), the concept assembles researchers who draw on quite different epistemologies and methods (Tonini and Liu 2017; Nielsen, Hauer, and Friis 2019; Schaffartzik and Kastner 2019; Seaquist and Johansson 2019; Verburg 2019). Telecoupling research views land-use change as a 'wicked problem' (DeFries and Nagendra 2017). In a globalized world, land-use change increases in scope and speed – we observe more land-use and land-cover changes across the globe and at quicker rates. The complexity of these changes is high as they hang together across spatial distance and are characterized by a decoupling of production and consumption. Telecoupling provides a lens through which these complexities can be systematically approached. It can thus be read as a conceptual attempt to reduce complexity:

[T]elecoupling presents land system scientists with a systematic approach that allows for breaking up the complexity of global interconnectivity into identifiable and manageable units of analysis, thereby addressing the problem of spatial disconnection of drivers and outcomes of land-use change. (Friis and Nielsen 2019b, 3)

In order to trace and describe telecoupled land-use changes five components direct the analytical attention: systems, flows, agents, causes and effects (Liu et al. 2013, 2014; Friis and Nielsen 2017a). This vocabulary helps researchers figure out who does what (agents), what processes are set in motion by them (flows), and where these flows are being directed (actively or passively) producing connections and feedback between spatially separated systems. The latter can then be classified (in relation to a particular land-based product) as a sending, receiving or spill-over system. The framework thus aims at a causal analysis that explains a specific land-use change (Friis and Nielsen 2019b, 3). Nonetheless, causal analyses have often remained limited to a study of causal effects and they leave the 'how' of causal mechanisms unexplained, as has been pointed out in a recent meta-study of existing telecoupling research (Carlson et al. 2018). Moreover, proponents of the framework emphasize the dynamic nature of telecoupled global connections and interactions as well as how apt the concept is for accounting for those temporal dynamics (Liu et al. 2019, 36). However, in empirical case studies the analysis of temporal dynamics mostly takes the form of a retrospective analysis (e.g. Friis and Nielsen 2017a) or a simulation of a specific land-use under changing circumstances through modelling methods (Millington et al. 2017; Dou et al. 2018). Indeed, the 'systems' are often presented as relatively static once defined and ascribed a position in the framework, i.e. sending or receiving system. Classifying systems as sending or receiving with regard to a specific resource, such as a crop, directs analytical attention to the position of the system in a globalized world and the flows that connect the systems. As mentioned above, doing this makes the process of approaching the globalization of land-based products more analytically manageable. However, there is rarely only one input or output direction and/or flow, and the position of a system is therefore often fluid, or a matter of definition according to the researcher (Friis and Nielsen 2017b). Competing or co-

existing flow directions that connect a specific system to other systems are often found and telecoupling research clearly shows that actors enter and disappear from the system and might change position within it (Friis and Nielsen 2017a), an insight that may have implications for whether flows are continuous, disrupted or redirected. When the latter two aspects occur, it becomes difficult to maintain the system's position with the framework of sending, receiving and spill-over systems.

Geographies of marketization

By focusing on the spatial nature of markets, economic geography has recently turned to the study of geographies of marketization (Berndt and Boeckler 2012; Boeckler and Berndt 2013; Ouma, Boeckler, and Lindner 2013). Shifting from markets to marketization puts aside questions about what a market is and how it can be delineated and focuses instead on the practical process through which a market is achieved (Berndt and Boeckler 2012, 200). Marketization, in other words, is the process through which markets emerge, are maintained and eventually altered. Instead of taking the existence of markets for granted, how they come into being in and through what practices become the focus of attention. Rooted in economic sociology and Science and Technology Studies (Granovetter 1985; Callon 1998; Çalışkan and Callon 2009, 2010) and the broader 'practice turn in contemporary theory' (Schatzki, Knorr Cetina, and von Savigny 2001), geographers (Everts, Lahr-Kurten, and Watson 2011; Everts 2016b; Schäfer and Everts 2019) have focused on practices in order to tackle 'the problem of interactions and dependencies between sites' (Everts 2016a). This allows addressing large notions such as food sovereignty from the 'interrelated everyday processes' in which they are enacted (Dünckmann and Fladvad 2016). Geographies of marketization thus explicitly inquire into what has not received attention in telecoupling research, namely the 'how' of 'the emergence of market orders and their continuous expansion' (Berndt and Boeckler 2011, 1058). Markets, like 'systems', are in this view 'practical accomplishments' (Berndt and Boeckler 2010, 566). Approached as such, we might be able to unmask marketization as an ambivalent process 'that is never complete and always prone to failure. Marketization is about establishing and severing linkages, it is about incorporating and expelling places, people and things' (Berndt and Boeckler 2010, 566).

Marketization thus directs analytic attention to the socio-material practices that create market commodities and actors, or systems in the telecoupling language. Markets interact with and touch down in specific places (and not others) and marketization takes shape depending on the product, stakeholders, and place. Indeed, 'practices are always situated practices; they do not transpire in a void but are situated in time and space [...] and are likely to involve a number of material entities' (Everts 2016a, 50). This is particularly obvious regarding land-based products such as crops. Place matters, not only in terms of its emplacement in the sense of socioeconomic and political context, but also in the sense of its biophysical characteristics, which may be adapted and transformed in some ways but resist others. How a market is made, what kinds of connections are established between specific actors and goods, and what practices occur as a result of this, become important questions that connect flows and places. Approaching markets as dis/continuous processes of market-making that can be empirically studied, thus enables us to understand why and how a market/system takes a specific form in which agents connect in particular ways and not others and flows take specific directions.

Methods

This paper is based on ethnographic fieldwork carried out in Ouagadougou, the capital of Burkina Faso and Bagré, which is situated in the Central Eastern Region. Fieldwork was conducted by the first author from May to November, 2017 and from May to August, 2018. Of the total nine months of fieldwork, around four and a half months were spent in Bagré while the remaining period was spent in Ouagadougou. The two sites are part of the same field. Both of the theoretical frameworks

discussed in the previous section were used as heuristics that directed the first author's attention – on practices rather than entities and their wider connections as opposed to only their local context and implications.

Bagré was chosen because it is one of Burkina Faso's most important rice producing regions (Burkina Faso/MAAH 2011, 8). Bagré rice has become a brand and is well known amongst the population of the capital Ouagadougou. Ouagadougou is also the main market for Bagré rice sales. Moreover, the headquarters of most institutions engaged in the Bagré Growth Pole Project (BGPP) and rice production are located in Ouagadougou. These include the World Bank, the Ministries, the National Food Security Agency (SONAGESS), as well as the MEBF (Maison d'Entreprise) and Bagrépôle – the two institutions through which the BGPP is implemented. From Ouagadougou, Bagré could be relatively easily reached by bus. While the first fieldwork phase from May to November had been planned according to organizational requirements, such as Visa accordance and fit within the graduate programme attended by the first author, the second fieldwork phase, from May to August, 2018, was chosen in order to cover the harvesting period and to trace the subsequent flows of rice from Bagré toward Ouagadougou and other places.

Participant observation (Kearns 2010; Laurier 2010) and, to a lesser extent, semi-structured interviews (Longhurst 2003; Dunn 2010) constituted the main methods applied (see Table 1 for an overview). The first author spent week after week accompanying and observing farmers,² processors, union leaders or project managers in fulfilling their daily tasks; from rice cultivation, to organizing

Table 1. Fieldwork overview.

Agents	Level in the rice system	Methods applied	Number (if applicable)
Rice farmers	Production	Participant observation & Semi-structured interviews	35
Village Groups (Groupements des producteurs du Riz)	Production	Participant observation & Semi-structured interviews	3
Bagré Rice Producer Union (Union des groupements des producteurs de riz de Bagré, U-GPRB)	Production	Participant observation & Semi-structured interviews	1
National Rice Producer Union (Union nationale des producteurs de riz, UNPR-B)	Production	Semi-structured interview	1
Bagré Seed Producer Union (Union des semenciers de Bagré)	Production	Semi-structured interview	1
Rice processors (ranging between 1–40 employees)	Processing	Participant observation & Semi-structured interviews	3
Bagré Rice Processor Cooperative (Cooperative des transformateurs de riz de Bagré, CTRB)	Processing	Participant observation	
Rice vendors	Distribution	Semi-structured interviews	35
SONAGESS (Société nationale de la gestion des stocks de sécurité alimentaire du Burkina Faso)	Distribution	Semi-structured interview	1
Bagrépôle	Managing	Participant observation & Semi-structured interviews	4
MEBF (Maison d'entreprise du Burkina Faso)	Managing	Participant observation Semi-structured interviews	1
Ministry of Agriculture	Managing	Semi-structured interview	1
World Bank	Financing	Participant observation & Semi-structured interviews	2
Local banks	Financing	Participant observation & Semi-structured interviews	2
National Institute for Research on Environment and Agriculture (INERA)	Research	Semi-structured interviews	2
Other research in Bagré (affiliated to different programmes and institutions)	Research	Participant observation	
Comité interprofessionnel du riz du Burkina Faso (CIR-B)	Cross-level	Semi-structured interview	1

union meetings and discussions, to the handling of compensation payments for displaced small-holders. Participant observation made it possible to establish relationships with people (Howitt and Stevens 2010) based on repeated encounters. Therefore, observation allowed for the gathering of not only factual information on their rice-related activities but also more sensitive insights into people's daily struggles and tensions within Bagré's complex social fabric. During the second field-work phase observations and informal conversations were complemented by semi-structured interviews with a stronger focus on specific aspects of rice sales and the relationship building necessary to keep the flow of rice steady.

Research in Bagré was complemented by fieldwork in Ouagadougou where mainly semi-structured expert interviews were conducted (Dunn 2010). In total, 27 such interviews were conducted with a broad range of actors (see Table 1) covering the most important actor groups along the rice value chain. Questions were tailored to each actor but also generally focused on the evolution of the respective organizations within the sector and the changes these organizations had been subject to over time. Relationships between the main stakeholders and the means of coordination, as well as the daily working tasks and routines, were also explored. Furthermore, questions focused on the place rice occupies in the public sphere of Ouagadougou (Thiombiano 1988; Bonnecase 2016) and how this is connected outwards (globally) and inwards (nationally).

When possible, the interviews were digitally recorded or detailed conversation protocols were written. Both were later transcribed and coded in MAXQDA software according to themes that emerged from the field as well as the academic literature. All the interviews were conducted in French or in Mooré with the help of a research assistant who also took care of the translation. Indeed, the work with an assistant was particularly fruitful. The assistant/translator not only translated the interviews from Mooré and French, but also helped facilitate an understanding of the broader context of the statements that were made. The mode of working together thus resembled a 'co-production, rather than a simple conveyance of data' (Middleton and Cons 2014, 183).

Finally, fieldwork data from Bagré was triangulated with texts and documents that circulated within and were constantly referred to in the field. These covered laws that regulate land access and tenure, project-related reports and studies, as well as a broad range of student theses, reports, lists and tables provided by different actors encountered during fieldwork. Many of the documents were made accessible at Bagrépôle or the MEBF.

The global-local entanglement of producing rice in Bagré, Burkina Faso

From the deserted Volta valley to the Bagré Growth Pole Project – toward establishing a new rice system

Rice is the fastest growing food source in Africa (Seck et al. 2012, 7). It receives massive political, scientific and media attention (Barbier, Compaoré, and Loncili 2008; AfricaRice 2011; Ouédraogo and Sawadogo 2017). In Burkina Faso, rice constitutes the fourth most important staple crop after millet, sorghum and maize, and the demand for rice has increased more quickly than for other food sources, especially in cities (Barbier, Compaoré, and Loncili 2008; Burkina Faso/MAAH 2011; Vorley and Lançon 2016). Numbers fluctuate but indicate a huge gap in domestic rice production compared to consumption. In 2017 Burkina Faso produced 325,566 tons of paddy rice, corresponding to around 195,340 tons of milled rice, while also importing 431,917 tons of milled rice (FAO 2017), for a combined value of \$15.6 M (USD) (OEC 2017).

Rice is targeted by the activities of a broad range of Burkinabe as well as international and non-governmental actors. These various actors support and organize its production, processing, transportation and commercialization (AfricaRice 2011; Burkina Faso/MAAH 2011; Wopereis et al. 2013). The main goal of government and non-governmental interventions is the strengthening of a national rice sector in order to reduce the dependency on rice imports and subsequent vulnerability to global food prices (Dawe and Slayton 2010; Nielsen and Vigh 2012). At the same time, the growth

of the rice sector is supposed to enhance the national economy and provide incomes to smallholders and employment opportunities along the rice value chain. In 2011 a National Rice Development Strategy was established (Burkina Faso/MAAH 2011). It set the stage for the strengthening of the rice sector in Burkina Faso by bundling all existing and planned interventions in the rice sector and was signed by a number of key ministries. It focuses on, for example, the development and promotion of improved rain-fed rice varieties and the conversion and construction of irrigation schemes along large dams on the country's three main rivers, the Mouhoun, Nazinon and Nakambé (Burkina Faso/MAAH 2011).

The development of irrigated rice production began after Burkina Faso (then still named Upper Volta) gained independence in 1960. The pressure on land increased in this period due to population growth, especially in the most densely populated part of Burkina Faso, the Central Plateau (Fauré 1997, 102). Assuring food security by increasing agricultural productivity quickly became a national and international priority. Therefore, new territories for agricultural production were opened and irrigation was given high priority. Constantly challenged by unstable and unfavourable climate conditions, including very variable rainfall, irrigation is generally considered the only solution that will build a resilient and productive agriculture sector in Burkina Faso (Dialla 2002, 63; see also Ouedraogo and Sedogo 2014; Venot et al. 2017). However, the use of surface water from the rivers has been severely hindered by the high prevalence of Onchocerciasis, or river blindness disease that expelled large parts of the population from the river valleys (Faure 1996, 120). Thus, in 1974 the World Health Organisation (WHO) together with the World Bank (WB), The United Nations Development Programme (UNDP), and the Food and Agriculture Organisation (FAO) launched the Onchocerciasis Control Programme (OCP). In parallel, the government created an authority for the development of the Volta valleys (Autorité pour l'aménagement des vallées des Volta – hereafter AVV). This was responsible for the valorization of the natural resources of the Volta valleys through conducting several environmental feasibility and impact studies, including in the area that would later become the Bagré Growth Pole Project (for the Sourou Valley see Dialla 2002).

The opening up of the rivers and their relatively fertile lands for agricultural production was further fuelled by political events in the early 1980s. In particular, Thomas Sankara's ascension to power in 1983 and his 1984 reforms that nationalized all lands and natural resources (Réforme agraire et foncière – hereafter RAF) had major consequences (Sankara and Prairie 2007 [1988], 43). Migrants from all over Burkina settled around Bagré and along river valleys as they no longer relied on authorization from the traditional administrators of the land (Faure 1996, 263). However, traditional authority was not simply abandoned and replaced. While abolishing traditional land tenure played out particularly in urban areas as major restructuration projects were implemented (Tinguiri 2013; Hauer, Nielsen, and Niewöhner 2018), traditional chiefs (Bissa in the case of Bagré) remained in charge of land access and management in many rural and peri-urban areas. The law did, nonetheless, create the potential for eviction in case of restructuring as a result of large infrastructure projects (Mathieu et al. 2003; Mathieu, Zongo, and Paré 2003). Revisions of the RAF in 1991 and 1996 gradually reintroduced private property and granted a legal status to territorial collectives. These revisions considered traditional modes of land management that, in effect, never fully ceased to exist. Today traditional chiefs still play a major role in facilitating land access, but state authority ultimately grants land rights. Private or collective rights can be withdrawn for public interest such as the construction of dams and irrigation complexes. The construction of the Bagré Dam started under Sankara's RAF and was only formalized in accordance with its revisions in 1998 when the area around the Bagré Dam was declared a 'Zone d'utilité publique' (ZUP), meaning that 'the land can thus be allocated by the State to any investors without further negotiations with/compensation to local populations' (World Bank document, Report Number AB5668).

The Bagré Dam was inaugurated in 1995. The provision of an irrigation system for rice production had been previously tested with the 1980 *Petit Bagré* Dam reservoir, which was constructed by the AVV along with 75 ha of irrigable rice parcels (Faure 1996, 265). With a height of 30 m and

containing 1.7 billion m³ of water, the new dam is the biggest in Burkina Faso. Providing irrigation for agriculture was not its only purpose. A hydroelectricity plant was also installed and connected to the grid of Ouagadougou (Yaméogo 2006, 91). Two main canals and a system of secondary and tertiary canals stem from the dam and irrigate the river valley on the left and right bank of the Nakambé. In the course of the canal system construction the *Petit Bagré* Dam was integrated into the irrigation scheme as a buffer reservoir.

Between 1995 and 2009, a total of 3380 ha of irrigable farmland were created in several project phases and funded by different sources (e.g. EU, Taiwanese Cooperation) (Bazin 2017). The majority of this land was attributed to smallholders for rice farming. As the area was then only sparsely populated, migrants were encouraged by the government of Burkina Faso to begin farming rice on the newly established fields. To house the settlers, new villages were constructed and new organizational formats implemented. Farmers who had previously worked alone were grouped into sixteen 'production' villages and together these villages formed the Bagré Rice Producer Union, which is a member of the National Rice Producer Union (Yaméogo 2006, 2015). The village groups and the unions are supposed to carry out coordination work such as orchestrating the cropping seasons and the acquisition of loans to enable the rental of tractors and the purchasing of fertilizer. However, these groups and unions face several challenges. Fees for membership are not being paid, orders are often not delivered, rice has vanished from the group's storehouses, and money has disappeared. Such challenges were repeatedly brought up during fieldwork and have also been documented by previous research (e. g. Yaméogo 2006; Bazin 2017). This has resulted, as we shall see in the next section, in a lack of trust in these organizations, especially by the farmers (for a report of similar problems in Burkina Faso's cotton sector see Gray and Dowd-Urbe 2013). Yet the organizational structure remains in place and the farmer's union is the first contact point for all matters of concern regarding rice farming in Bagré. The weaknesses of the union are acknowledged, and strengthening them by focusing on improving institutional capacities is an integral part of the Bagré Growth Pole Project. Still, the rice production by smallholders seems to have its limits. In order to enable more cost-efficient land-use to fulfil the demand for rice, the initial focus on allocating land to smallholders was changed in 2011. Of the additional 4394 ha under conversion since 2011, 2072 ha are dedicated to smallholders and 2322 ha to private investors (Venot et al. 2017, 11; Bagrépôle June 2018). In return for land access, the latter are supposed to contribute to infrastructure development such as extending the canal systems or install pumps to get water from the primary canal to the fields through public-private partnerships.

Since the Bagré Growth Pole Project was launched in 2011, Bagré has also seen the opening of new institutions and service providers such as gas stations, hotels and banks. Bagrépôle, as well as the Maison d'Entreprise, the two main implementing institutions of the Bagré Growth Pole Project, have opened satellite offices in Bagré. Bagrépôle acts as the zone authority. They lead the construction of the irrigation scheme, infrastructure development, and management of the agricultural activities in the zone, including land and water management and crop calendar coordination. The Maison d'Entreprise aims at strengthening the private sector engagement in order to promote economic development. Indeed, the scope of the Bagré Growth Pole Project is not limited to rice:

The objective of the Bagré Growth Pole Project for Burkina Faso is to contribute to increased economic activity in the project area, resulting in an increase in private investment, employment generation and agricultural production.³

Today, the wider project area of the *Zone d'utilité publique* (ZUP) that constitutes the Bagré Growth Pole Project area comprises almost 500,000 ha of land. However, most interventions concentrate in a zone of approximately 50,000 ha around the Bagré Dam, corresponding largely to the Province of Boulgou (IUCN, GWI, and iied 2010). The majority of the population (543,570 in 2006 and an estimated 744,823 in 2017, INDS 2018) are Bissa, Mossi and Peuhls. Generally, the mainly rural population makes a living from agriculture, pastoral farming or fishing.

The coevolution of rice fields and markets – expanding the rice system

As sketched out above, political initiatives and infrastructure development for consolidating and boosting the production of rice in Bagré were well established by the time of fieldwork conducted for this study. Since the early 1990s, and especially with the construction of the large dam, the Bagré region has started producing rice on irrigable parcels. Yet, many farmers, as well as the producer unions, reported on the difficulties of selling their rice. The challenge of selling surplus rice in Bagré was not related to poor connectivity and lack of transport infrastructure since Bagré is relatively well connected in terms of roads to the large urban rice markets in Tenkodogo and Ouagadougou. In fact, consumer preferences for imported rice were frequently mentioned as a major obstacle. Two main reasons were given for this. First, it is industrially processed. This means that it is cleaner than local rice in which little stones and other residues can be found. Second, nationally produced rice tends to enter the market in the year of its harvest, meaning that it is less dry than imported rice. Imported rice thus ‘swells’ much more when cooked and is therefore perceived as providing larger quantities than the national rice. Marketing programmes that promote the quality and nutritiousness of local rice have been one answer to this. Bagré rice has been particularly targeted and promoted by advertising paid for and run by the government and funding institutions such as the World Bank and the German Office for International Cooperation. A network of Bagré rice-selling points across Ouagadougou was, for example, established by the German organization.

Still, rice sales have only slowly increased. This has left farmers with few revenues and resulted in the government taking further measures to promote the consumption of local rice. Buying up Bagré rice for the national food security stock of the SONAGESS has been one such initiative. As reported in an interview with a SONAGESS officer, another initiative has been the buying of local rice for provisioning public institutions like schools, prisons and hospitals. This seems to be working as farmers in Bagré mentioned during conversations and interviews that the business of selling rice is improving.

[T]he government has helped us on that. For the first time now, we don’t have problems selling our rice. I could even sell more, so I don’t think that we will have problems with the new rice fields starting. I would even want to gain more hectares so I can cultivate more. I could sell it. (Interview with rice farmer, Bagré, 23/06/2018)

The government’s campaigns were so effective that Bagré rice could no longer be found throughout the year in Ouagadougou stores. From the rice vendor’s perspective, this was a problem and severely hindered consumers’ willingness to switch to purchasing local rather than imported rice:

When the people cannot always get the rice, it is a problem. In the beginning, it was difficult to sell the rice at all. Now people come to appreciate its quality and freshness, but if the supply is not steady, they buy the imported rice. (Interview with rice vendor, Ouagadougou, 27/06/2017)

In response to this, Bagré’s zone authority further pushed rice production as well as the production of other crops such as vegetables. New extensions were continuously planned and executed over the years. Farmers who had moved to Bagré during the opening phases of the irrigable areas in the late 1990s were provided with additional plots. The zone authority also claimed land to distribute to small investors or farmers whose plots became unusable for various reasons, for example after a flood. In other words, the success of marketing the Bagré rice contributed to increased pressure on land in the project zone, leading not only to the extension of irrigable rice terraces, but also to an increasingly intensive concentration of agricultural activity around these terraces.

Making and maintaining new connections – alternative rice systems and uncertain futures

The rice price, or what the farmers get for their production, constituted another major topic in Bagré. In 2018 farmers usually received 160 FCFA per kilo. Although the price has risen continuously over the last years, farmers generally stated that it was too low. Major financial costs for seeds, fertilizer, labour, herbi-, pesti- and fungicides, and transport from the field to the drying squares and central

selling points were the main reason for this sentiment. However, during interviews conducted in 2018 with farmers and observing the actual rice selling process a more differentiated picture of their decision-making regarding selling rice emerged.

As we mentioned above, the selling of rice has become easier due to government efforts. This was confirmed by one of the owners of one of the largest rice processing facilities in Bagré:

I buy as much rice as I can. I could even buy more. I even rented new store houses and as you know invested in a new truck so I can assure the transport. The demand is there and the machine [for processing the rice] as well. But of course, I need cash and sometimes my buyers are also late, so I have to wait to purchase rice from the farmers, because I need to pay them if I do. If I had more cash, I could buy more rice. (Interview with rice processor, Bagré, 12/07/2018)

Although the demand for rice increased, this did not immediately cause a price rise. The rice processors located in Bagré and rice buyers operating in Bagré still traded rice at the price of 160 FCFA per kilo. Asked why, the processors explained they could not afford to pay more. The farmers did not contest this. Indeed, they were not asking for higher prices when selling their rice. Rather, they sold their rice to fulfil obligations and strengthen personal relations and they often mentioned that asking for higher prices might jeopardize this. Selling rice in Bagré is not primarily a matter of price. Rather, flows of rice stabilize social bonds in various ways. Local rice processors, for example, advanced payment to small farmer groups to purchase fertilizer for rice production. This down payment the farmers reimbursed in the form of harvested rice. The farmers kept as much rice as they needed for family consumption and sold the leftover production to the same processor.

Yes, I sell my rice to UDIRBA [local purchaser]. I work with him for years. He lends me money for the fertiliser and I sell him all my rice, after I take some bags for my family. I do good quality rice, so the processor is content. Others pay more they say, but I have signed a contract, so I have to respect the contract. Also, I think it is good to work with someone from here. It's reliable. (Interview with rice farmer, Bagré, 13/06/2018)

This credit system is often the only way for farmers to obtain support as the banks are quite reluctant to support small farmer groups, in particular since bad harvests caused major payment delays. Granting loans, as described above, created trust, reliability and mutual obligations for both, farmers and processors. Whereas the farmer needs the credit to cultivate in the first place, the processor needs to make sure he receives enough paddy rice to process and fulfil wholesaler demands. If a farmer had any rice left after the repayment of loans and personal use, he would bag the rice and take it to the storages around the processing units. In the presence of the farmer the rice would be weighed there. The rice would also be quality-checked, although the relationship between the farmer and the processor made this largely a formality. A processor explained:

When I buy the paddy rice fresh from the harvest, I know it is okay. I will have to dry it and store it better than farmers would in their houses with leaking roofs. But I've followed the cropping season, because I live here as well. So, I know what they have. (Interview with rice processor, Bagré, 27/06/2018)

However, the contract arrangements between processors and individual farmers or, and more often, small farmer groups of 5–10 members, were not the only organizational form that connected rice farmers and buyers in Bagré. To collectively finance inputs like seeds and fertilizer for the fields was also a major reason behind the establishment of Bagré's farmer union. Officially, all farmers were part of one village group, each of which comprised of around 100 farmers. Altogether, they constitute the farmer union of Bagré. The purpose is that the groups facilitate bank loans for farm inputs and purchase and distribute them before each cropping season. The farmers in turn back-up one another to assure the repayment. On the union level the selling would be organized, thereby enabling farmers to achieve better prices and fulfil huge demands. However, the farmers did often not trust one another across these larger groups and felt that some shuffling around of money was going on in the village groups and the union. Moreover, informants often mentioned that rice had vanished from the shared storage houses and that the overall process was non-transparent. Hence, many looked for

different ways of gaining support to purchase fertilizer, including most commonly making contracts with processors as explained above.

As the processors in Bagré did actually not have enough resources to make contracts with all farmers, the latter needed to ensure their supply by other means. Many farmers were thus neither bound to the farmer's organizations nor to any particular buyer or processor. This opened up for new relationships to emerge and redirecting the rice flows in sometimes unexpected ways. During fieldwork borrowing money from local or even more distant, e.g. in Ouagadougou, business men was reported. But borrowing money from people not embedded in the local rice sector had social and environmental implications. The lenders, many interviewees explained, would not question farming practices or give good advice on for example environmental consequences of agricultural practices as would the farmer organizations or local processors who were much more concerned about how the rice they were buying was produced. International cooperation and NGOs for example would approach either farmer organizations or the large processors in Bagré to organize trainings for farmers on sustainable agricultural practices in order to make the rice production more environmentally friendly. This training only reached those farmers, who either actively participated in the farmer organization or were in a contract arrangement with a processor. The farmer organizations as well as the processors also had a say on what rice variety to plant when, and how much fertilizer to apply. As such, the local contractual arrangements provided them with a certain influence over the farmer's farming practices.

Extraordinarily, at least according to informants, a huge amount of rice was purchased by Ghanaian rice buyers in 2018. Presumably, hundreds of tons of rice were sold to factories in Kumasi, Ghana. During fieldwork, it was not possible to identify who exactly had facilitated and was behind the purchase, but rice vanished to Ghana and local rice processors struggled to fill their storage houses. Concerns about rice leaving the country quickly emerged as the government of Burkina subsidized fertilizer to help the farmers produce extra rice. Indeed, this selling directly undermined the intimate connection between the Bagré Growth Pole Project and national food sovereignty and the absence of regulation was problematized:

They [the Ghana traders] just buy everything, no matter what quality. It doesn't matter to them. We try to get the farmers to assure good quality. But they destroy the market. Farmers then only see quick money making. But who knows if they ever come back. Some years ago, Nigerian buyers came. We didn't even know where they came from. And then they never come back. And then farmers wait while their stocks are spoiling. (Interview with rice processor, Bagré, 27/06/2018)

The local processors are clearly concerned with the functioning and sustainability of newly emerging connections and doubt that they may stabilize. Although they acknowledge that the farmers can access new markets, they wonder if the distant buyers would bring the same level of care to the local rice system that they themselves brought along. The desire to protect the emerging Burkina Faso rice markets hence also manifested on the fields. The words of one of the processors capture this:

We need to make sure that what we produce here reaches our own people. The government invests here and our people do the work, so they should also profit from it and not make all of these efforts to supply rice markets elsewhere while we continue to import tons of rice from elsewhere. (Interview with rice processor, Bagré, 27/06/2018)

Discussion

Agricultural development to improve food security is high on the political agenda of Burkina Faso (e.g. PNDES 2016-2020). Agriculture is the most important economic sector in the country and developing this sector is considered key to realizing national food sovereignty and security. To achieve this, a number of initiatives have been launched since the early 1970s. The targeting of unexploited land, particularly along river beds, and better use of human resources through

infrastructural developments and capacity building have been key in these initiatives. The Bagré Growth Pole Project, located in the Nakambé valley region of Central Eastern Burkina Faso, is a flagship initiative that illustrates these efforts. By tracing the history, establishment, and aims of the national desire for rice, the project, and the arrangements through which the farmers, processors and others engage with a rice market constantly in the making, we account for the observed land-use change, or the emergence of rice paddies in Bagré. A key finding is that the rice fields and the rice market co-evolve together rather than one causing another. How the rice is sold, under what conditions and arrangements and to whom, potentially frames how the rice is ultimately farmed. We therefore show how the practical work of building a rice market and converting land to irrigable rice fields are intertwined and therefore need to be addressed together in order to gain a better understanding of the rice sector in Burkina Faso.

Following the geographies of marketization literature, we addressed some of the practices of farmers, traders, and state and non-state actors in the creation of Burkina Faso's rice sector. By identifying elements such as land conversion through construction works and infrastructuring of the landscape, changing land laws and property relations, and the everyday management of land-use through external support, advice, and attention to their interconnectedness, we assemble the marketization-land-use change nexus as an ongoing process (Berndt and Boeckler 2010, 566). As such, the emergence of Burkina Faso's rice market is not simply a reaction to the country's weak position on a global rice market and an attempt to reduce dependency and achieve food (or rather rice) sovereignty. Instead, the rice fields of Bagré are an incremental process of making and reconfiguring connections between people and places as well as instances and institutions. Our results also reveal the sector-inherent tensions arising as a result of this process of market-making and reconfiguration. Stabilization fostered by the continuous expansion of the irrigation system and subsequent establishment of additional rice fields, or by extending contract arrangements between Bagré's rice farmers and local rice processing facilities, is constantly challenged by irritations such as the sudden appearance of rice buyers from Ghana who absorb huge quantities of rice supposedly meant for Burkina Faso.

By addressing major concepts such as food sovereignty from the perspective of 'interrelated everyday processes' (Dünckmann and Fladvad 2016, 25), results such as ours illustrate the main benefit of the geographies of marketization literature. Namely, that the emergence of markets and their expansion or retraction (Berndt and Boeckler 2011, 1058) are practical accomplishments and assemblages of heterogeneous and sometimes contentious elements that must be empirically established (Berndt and Boeckler 2010, 566). At the same time, thinking through the lens of telecoupling helps us to embed these local processes of fostering rice production in Bagré within a larger, and even global, context. The rice production in Bagré, and Burkina Faso at large, is also a result of a long-term attempt to decouple Burkina Faso from an unpredictable global rice market. Integrating the global in a more systemic way has implications for the analysis of the observed connections between people and places. It also has implications for instances and institutional connections that, as telecoupling research reminds us, transcend the local market-making process.

Focusing on the actual practical work of 'market-making' in a particular place at a particular time while keeping a telecoupling research approach in mind hence illustrates how marketization is about establishing and severing local and global linkages; it is about incorporating and expelling places, people and things at different sites and at different scales (Berndt and Boeckler 2010, 566; Friis and Nielsen 2017b). This is clearly the case in Bagré where an intricate intermingling of disease eradication, national land legislation, migration, the presence of international donors, marketing campaigns, infrastructural developments, access to credit, and the political desire behind all of this – namely the establishment of a national rice sector – all came together as a combination of global and local realities. Markets, clearly, are grounded and tangible in specific places and at particular times. Accordingly, marketization is profoundly local when it concerns land-based products such as rice, as it depends upon and involves a number of material entities such as soil and water resources (Everts 2016a, 50). The geographies of marketization literature reminds us, therefore, that markets are situating, but they are also situated (Ouma 2015, 116). This implies that when we deal with a

radical market/production re-orientation such as Burkina Faso's rice sector we must not lose sight of the 'global modernity' that might frame this process (Berndt and Boeckler 2012, 200). In this way, combining telecoupling and geographies of marketization research proves insightful. Indeed, our results highlight how the rice market-making in Bagré is simultaneously a local and global process co-constituted exactly within this dynamic. The nexus of rising levels of food imports, an unstable climate for the production of staple crops, and a growing population, has created an increasing dependency on food imports. The attempt to boost national food production, that goes back to the 1970s in places like Bagré, is therefore not simply the sum of a local process of marketization. It is also an example of how a country like Burkina Faso actively engages with its own position in a global food production system. Burkina Faso's emerging rice system appears in this way to also be a reaction against and a way to cope with the spill-over effects of a global rice market that manifested most prominently in food shortages during the global food price crisis in 2007/2008 (Engels 2015, 2017). Understanding Burkina Faso as a spill-over system therefore illuminates why national, and ultimately local, processes of marketization occur. The systems perspective at the heart of the telecoupling concept allows us, in other words, to ask for the broader implications and causal relations behind the different practices that constitute the Bagré rice market. Telecoupling research prevents us, so to speak, from getting lost in microscopic analyses by drawing our attention to the global dynamics these practices are embedded in and, at the same time, possibly shape.

In sum, our results highlight the need for analyses that incorporate theoretical approaches such as the two presented in this paper. Only then can we understand the rice paddies in Bagré as an ongoing and grounded process within a global systemic configuration. This adds to our understanding of how specific systems emerge, react and are ultimately reconfigured, moving potentially from being spill-over systems to sending systems, as the case of Ghanaian rice buyers illustrates. For telecoupling research, this is a timely reminder that systems are never fixed and that assigning systems definitions such as sending, receiving and spill-over, while useful, can also prevent us from actively engaging with how these systems are 'alive' and full of agency. As illustrated in this paper, this is the insight that the geographies of marketization literature adds. However, the process of market-making is increasingly caught up in global dynamics and the incorporation of telecoupling research into the geographies of marketization literature reminds us of this.

Conclusion

In this paper, we have dealt with the Bagré Growth Pole Project, one of 36 current growth poles operating across the African continent and the first project of this kind in Burkina Faso. We have taken the emergence of rice paddies in Central Eastern Burkina Faso as a starting point for interrogating the interrelatedness of land-use change and processes of marketization. This was accomplished by exploring different constellations of the Bagré Growth Pole Project from an everyday practices perspective and with regard to the actual and potential system implications of introducing rice production to Bagré and establishing a value chain and national rice market. We explored distinct components of the Bagré Growth Pole Project and pointed out their actual and potential social, economic and environmental effects. By addressing the aspect of land rights, tenure, and the question of who will utilize and profit from the land that is turned into agricultural parcels through the installation of irrigation, we showed that while smallholders were prioritized when the first segments of irrigated rice parcels were attributed, larger agrobusinesses are benefiting in the later project phases. Given the difficulties of the farmer unions described, there is thus a risk that smallholders' needs and interest are put aside. The paper also addresses the question of subsidized rice sales. We showed the connection between them and national food sovereignty, regional competitiveness and global food prices. Monitoring and tracing the shifts in rice flows over time will remain important to assure that the law of the market does not rule out the attempts to strengthen a national rice market and supporting neighbouring countries rather than Burkina Faso. Moreover, we have outlined potentials for responsible farming practices. In particular we showed how local rice processors are in the

position of fostering social and environmentally friendly farming practices by being closely related with the farmers as well as the land to be farmed.

To do so, we combined the theoretical approaches of marketization and telecoupling. The geographies of marketization literature helped us to trace the conditions for and practices of rice farming and selling in Bagré that shape the landscape and livelihoods in the region. This literature illustrates how legal, economic, historical, political and social dynamics are assembled in particular sites. Employing the telecoupling concept allowed us to place these dynamics within a broader global context and to grasp the conditions for their entanglements and potential de/stabilization within a global rice market. This paper thereby fostered a dialogue between two highly contemporary strands of literature that engage with land-use change and markets in a globalized world. This combination between lenses and epistemic positions is necessary and useful if we want to understand how markets are simultaneously situated and situating. It is our conviction that as existing Growth Pole projects are pushed forward and new ones established across the African continent switching lenses and epistemic positions is necessary and useful to better understand the social, economic and environmental outcomes of emerging markets across different scales.

Notes

1. <http://www.yieldgap.org/burkina-faso> [last accessed 04 December 2019].
2. Rice farmers in Bagré are a heterogeneous group. Bazin (2017, 26–28) provides a differentiated description of the category ‘rice producer’. However, for the analysis of everyday practices, these differences do not play a crucial role. Overall, we focus on small-scale farmers who usually farm less than 1 ha of irrigated rice plots.
3. <http://projects.worldbank.org/P119662/burkina-faso-bagre-growth-pole-project?lang=en&tab=overview> [02 June 2019].

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